

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Date: April 2, 2004

GOPICHANDRA SURNILLA and
MICHAEL J. CULLEN

Filed : concurrently with application

For : METHOD TO CONTROL TRANSITIONS BETWEEN MODES
OF OPERATION OF AN ENGINE

Mail Stop PATENT APPLICATION
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

S i r :

INFORMATION DISCLOSURE STATEMENT
UNDER 37 C.F.R. §§ 1.56, 1.97, and 1.98

Applicant is submitting this Information Disclosure Statement pursuant to 37 C.F.R. §§ 1.56, 1.97, and 1.98 to disclose to the U.S. Patent and Trademark Office the patents, publications, applications, and/or other references listed on the enclosed, completed PTO-1449 form(s). The filing of this Information Disclosure Statement should not be construed as a representation that a search has been made or as an admission that the listed references are prior art for this application. Applicant respectfully requests that the listed references be expressly considered during prosecution of the application, and that the references be made of record therein and appear among the "references cited" on any patents issuing therefrom.

CONTENT OF DISCLOSURE

This Information Disclosure Statement includes (1) 4 pages of PTO-1449 forms, and (2) a legible copy of each foreign and non-patent reference, if any, listed on the form(s). However, because this application was filed on or after July 1, 2003, no copies of U.S. patents or published U.S. patent applications are included.

FOREIGN-LANGUAGE REFERENCES

A concise explanation of the relevance of each listed reference not in the English language follows:

Japanese Patent No. 62247176: To obtain the maximum combustion efficiency of an engine as a whole by allowing the spark plug in each cylinder to be ignition-timing-controlled independently, in the engine equipped with the cylinders for lean combustion and the cylinders for rich combustion.

The first cylinders 11-13 which are operated by the supply of the mixed gas in the vicinity of a theoretical air-fuel ratio and the second cylinder 14 into which the mixed gas in lean state is supplied in the low load operation and which is operated by the supply of the mixed gas in the vicinity of a theoretical air-fuel ratio in the operation other than the low load operation are provided. In such an engine, the spark plugs 51-54 installed onto the respective cylinders 11-14 are connected with a distributor 55, and supplied with the high voltage supplied from an ignition coil 56 controlled by the ignition instruction signal supplied from an ECU 60. Said ECU 60 is installed to allow the first cylinders 11-13 and the second cylinder 14 to perform the ignition timing control independently on the basis of the advance map memorized for the cylinder in each group according to the output of a cylinder discriminating sensor 57.

Japanese Patent No. 55049549: To satisfy both the exhausting and driving performances by shifting from pausing cylinder group to operating cylinder group every time the whole cylinder operation is shifted to the partial cylinder operation without causing a bad driving feeling.

Outputs of the oxygen sensor 5-7 placed in the exhaust pipe 1b- 1d, in which three catalyzers 2-4 are provided, are fed as an air-fuel ratio compensating signal from the change circuit 16 to the fuel injection control circuit 11 through the air-fuel ratio control circuit 17. The said circuit 11 accepts outputs of the sensor for suction air quantity 9 and sensor for the number of rotation 10, and provides a corrected injection signal synchronized with the number of rotation to the injection valves 13 of cylinders #1-#3 and the ones 14 of cylinders #4-#6 through the control circuit for the number of cylinders 12. Also the said circuit 12 cuts off the fuel feed to the cylinders #1-#3 or the ones #4-#6 selectively in the range of less load, and changes the operated cylinders group to the other every time the whole cylinders operation is changed to the partial cylinders operation.

Japanese Patent No. 55029002: To keep good exhaust cleaning action all the time by stopping the control of the cylinder number under low-temperature condition that oxygen sensor does not operate properly.

When the revolution number of engine and the pulse width of fuel injection are in the 6-cylinder zone, the output level of the VCS circuit 16 is 1 and the cylinders #1 to #3 are put into operational state. Then, the output of the oxygen sensor 10 is put in the air-fuel ratio control circuit 12. When the engine becomes a light-load state and the pulse width and the engine revolution number shift to the 3-cylinder zone, the cylinders #1 to #3 come into stopped state. Thus, the selective relay 11 is

switched to the oxygen sensor 8 side and the ternary catalyst 7 on the working cylinder groups #4 to #6 exhibits a high conversion efficiency. When the catalyst 9 and the oxygen sensor 10 are cooled to a low temperature at which their proper outputs cannot be exhibited, whole cylinder operation is restored forcibly by the output of the low temperature detector.

Japanese Patent No. 7035016: To provide a uniform burning state for each cylinder group o as to enhance stability of an engine by changing a burning state of each cylinder group in order to improve the burning state of a cylinder group in a poor burning state on the basis of the burning state of each cylinder group.

A control unit 6 reads in a water temperature TF on a front bank F side and a water temperature TR on a rear bank R side on the basis of signals output from water temperature sensors 4, 5. When a rotation varying ratio $\Delta n < \text{an allowable limit value } n_1$, an ignition timing ADVR on the rear bank R side is corrected to a delay angle side, thereby increasing an exhaust temperature. When $\Delta n \geq n_1$, the ignition timing ADVR is corrected to an advance angle side, thus securing stability of an engine. Thereafter, a value obtained by multiplying a difference between the water temperatures TS, TF by a predetermined coefficient is added into the ignition timing ADVR, thereby calculating an ignition timing ADVF on the front bank F side. Namely, the ignition timing ADVF is set toward the advance angle side by a value equivalent to the difference between the water temperatures with respect to the ignition timing ADVR.

German Patent No. 10107158: A controller for a cylinder cut-off type internal combustion engine is provided for ensuring an activated state of catalysts in cylinders, which are stopped during a partial cylinder operation, at all times to maintain

favorable emission characteristics upon switching from the partial cylinder operation to a full cylinder operation, and for maintaining a satisfactory fuel consumption rate by conducting the partial cylinder operation to the utmost. The cylinder cut-off type internal combustion engine can be switched between the partial cylinder operation and the full cylinder operation. Exhaust gas from cylinders in a right bank, which are switched off during the partial cylinder operation, and from cylinders in a left bank is purified by two catalyst units in exhaust pipes independent of each other. The controller estimates an estimated catalyst temperature of the catalyst for the right bank, and disables the partial cylinder operation when the estimated catalyst temperature is below a predetermined temperature

TIMING OF DISCLOSURE / FEE INFORMATION

This Information Disclosure Statement is being filed with the application or with a Request for Continued Examination of the application under 37 C.F.R. §1.114. Therefore, in accordance with 37 C.F.R. § 1.97(b), no fee or statement under 37 C.F.R. § 1.97(e) is required.

Please contact the undersigned with any questions or comments regarding this Information Disclosure Statement.

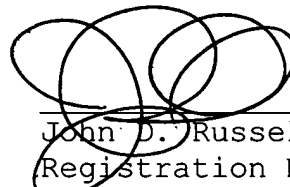
"Express Mail" Mailing Label
No. EV479389166US
Date of Deposit -
April 2, 2004

I hereby certify that the attached correspondence is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 C.F.R. 1.10 on the date indicated above and is addressed to: Mail Stop PATENT APPLICATION, Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.


Lauren Barberena

Respectfully submitted,

KOLISCH HARTWELL, P.C.



John D. Russell
Registration No. 47,048
Customer No. 36865
520 S.W. Yamhill St., Suite 200
Portland, Oregon 97204
Telephone: (503) 224-6655
Facsimile: (503) 295-6679
Attorney for Applicant

FORM PTO-1449			DOCKET NUMBER FGT 387CON		APPLICATION NUMBER	
INFORMATION DISCLOSURE CITATION IN AN APPLICATION			APPLICANT(S) Gopichandra Surnilla			
			FILING DATE		GROUP ART UNIT	
U.S. PATENT DOCUMENTS						
EXAMINER INITIAL	DOCUMENT NUMBER	DATE	NAME	CLASS	SUB CLASS	FIL. DATE IF APPROP.
	3,696,618	10-10-72	Boyd et al			
	4,046,126	9-6-1977	Takemoto			
	4,051,673	10-4-1977	Masaki			
	4,134,261	1-16-79	Iizuka et al			
	4,172,434	10-30-1979	Coles			
	4,207,855	6-17-80	Phillips			
	4,305,249	12-15-1981	Schmid et al.			
	4,467,602	8-28-84	Iizuka et al			
	4,690,116	9-1-87	Takahashi			
	4,860,716	8-29-89	Deutschmann			
	5,179,924	1-19-1993	Manaka			
	5,245,978	9-21-93	Orzel			
FOREIGN PATENT DOCUMENTS						
	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUB CLASS	TRANSLATION YES NO
	1496605	12-30-77	GB			
	2090331	7-7-82	GB			
	62-247176	10-28-87	JP			Abstract only
OTHER DOCUMENTS						
EXAMINER			DATE CONSIDERED			

FORM PTO-1449		DOCKET NUMBER FGT 387CON		APPLICATION NUMBER		
INFORMATION DISCLOSURE CITATION IN AN APPLICATION		APPLICANT(S) Gopichandra Surnilla				
		FILING DATE		GROUP ART UNIT		
U.S. PATENT DOCUMENTS						
EXAMINER INITIAL	DOCUMENT NUMBER	DATE	NAME	CLASS	SUB CLASS	FIL. DATE IF APPROP.
	5,267,548	12-7-93	Rosenzopf et al			
	5,375,415	12-27-94	Hamburg et al			
	5,492,094	2-20-1996	Cullen et al			
	5,496,228	3-5-96	Takata et al			
	5,672,817	9-30-1997	Sagisaka et al			
	5,727,522	03-17-1998	Otani et al.			
	5,778,666	7-14-98	Cullen et al			
	5,930,992	8-3-99	Esch et al			
	5,950,603	9-14-99	Cook et al			
	5,992,142	11-30-99	Pott			
	6,014,963	1-18-00	Narita			
	6,023,929	2-15-00	Ma			
FOREIGN PATENT DOCUMENTS						
	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUB CLASS	TRANSLATION YES NO
	55-49549	4-10-80	JP			Abstract only
	55-29002	3-1-80	JP			Abstract only
	2283111	4-26-95	GB			
OTHER DOCUMENTS						
EXAMINER			DATE CONSIDERED			

FORM PTO-1449 INFORMATION DISCLOSURE CITATION IN AN APPLICATION		DOCKET NUMBER FGT 387CON		APPLICATION NUMBER			
		APPLICANT(S) Gopichandra Surnilla					
		FILING DATE		GROUP ART UNIT			
U.S. PATENT DOCUMENTS							
EXAMINER INITIAL	DOCUMENT NUMBER	DATE	NAME	CLASS	SUB CLASS	FIL. DATE IF APPROP.	
	6,116,213	9-12-00	Yasui et al				
	6,158,218	12-12-00	Herold et al				
	6,161,531	12-19-00	Hamburg et al				
	6,247,445	6-19-01	Langer				
	2001/0011540	8-9-01	Mashiki				
	6,276,138	8-21-01	Welch				
	6,305,344	10-23-01	Perry				
	6,324,835	12-4-01	Surnilla et al				
	6,327,850	12-11-01	Yasui et al				
	6,345,496	2-12-02	Fuwa et al.				
	6,349,710	2-26-02	Kawai et al				
	6,360,713	3-26-02	Kolmanovsky et al				
FOREIGN PATENT DOCUMENTS							
	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUB CLASS	TRANSLATION YES NO	
	07-035016	2-3-95	JP			Abstract only	
	10107158	8-23-01	DE			Abstract only	
OTHER DOCUMENTS							
EXAMINER				DATE CONSIDERED			

FORM PTO-1449			DOCKET NUMBER FGT 387CON		APPLICATION NUMBER		
INFORMATION DISCLOSURE CITATION IN AN APPLICATION			APPLICANT(S) Gopichandra Surnilla				
			FILING DATE		GROUP ART UNIT		
U.S. PATENT DOCUMENTS							
EXAMINER INITIAL	DOCUMENT NUMBER	DATE	NAME	CLASS	SUB CLASS	FIL. DATE IF APPROP.	
	6,367,443	4-9-02	Bassi et al				
	6,382,193	5-7-02	Boyer et al				
	6,389,806	5-21-02	Glugla et al				
	6,408,618	6-25-02	Ide				
	6,415,601	7-9-02	Glugla et al				
	6,467,259	10-22-02	Surnilla et al.				
	6,505,464	1-14-03	Isobe et al				
	6,513,509	2-4-03	Matsumoto				
	6,539,784	4-1-03	King et al				
	6,543,219	4-8-03	Surnilla				
	6,546,910	4-15-03	Tanaka et al				
	6,550,240	4-22-03	Kolmanovsky et al.				
	6,568,177	5-27-03	Surnilla				
	6,619,241	9-16-03	Otterspeer et al				
	2003-0221664	12-4-03	Surnilla				
FOREIGN PATENT DOCUMENTS							
	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUB CLASS	TRANSLATION YES NO	
OTHER DOCUMENTS							
EXAMINER				DATE CONSIDERED			